ATOMIC ENERGY Newsletter

THE FIRST AND ONLY A

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December 15th, 1953.
Vol. 10...No. 9/0

Dear Sir:

A new proposal for the international use of nuclear energy was made by President Eisenhower in the last fortnight before the United Nations, in New York. The President proposed that the United Nations create a stockpile of normal uranium and fissionable materials to be used for the purpose of peace, not of war. This stockpile was to be accumulated by contributions from all major atomic powers. The proposal, an attempt to halt the atomic arms race, was embodied in a speech that summarized atomic weapons development. The president noted that the U.S. stockpile of atomic weapons (estimated by some to exceed 1,000 in number), in explosive capability, exceeds by many times the explosive total of all bombs and all shells used in World War II. He observed also that all the armed forces of the United States were capable of utilizing atomic weapons; as to the hydrogen weapons, the President reported that they are in the ranges of millions of tons of TNT equivalent. (Assisting the President with the preparation of the speech were Lewis L. Strauss, Chairman, USAEC, and C. D. Jackson, a Presidential assistant on psychological warfare.)

A recommendation that the USAEC be represented on the National Security Council, the nation's top policy-making agency, was made last fortnight by Thomas E. Murray, USAEC Commissioner, in an address at Marquette University, in Milwaukee. Mr. Murray complained, furthermore, that U. S. policy makers for years had gone about their business of defending the U.S. security with little understanding of atomic weapons. This was so, he said, despite the fact that fusion and fission weapons are not only making conventional weapons obsolete, but they are also making obsolete previous concepts of the nature of war. These totally new aspects of atomic energy, plus secrecy regulations, had produced what Mr. Murray termed a "dangerous leave-it-to-the-experts attitude" on the part of the government.

The industrial hygiene fellowship program of the USAEC, and that in radiological physics which are to be continued for the 1954-55 school year, are now receiving applications at the Oak Ridge Institute of Nuclear Studies, Oak Ridge, Ky. The industrial hygiene program is conducted at the Harvard University school of public health, and the University of Pittsburgh graduate school of public health. The radiological physics fellowships are carried out in three separate programs: at Vanderbilt University and Oak Ridge National Laboratory; at the University of Rochester and Brookhaven National Laboratory; and at the University of Washington and Hanford Works. (The industrial hygiene course, which encompasses the usual industrial hazards, deals as well with those peculiar to atomic energy: the handling of radioactive wastes and flue gases, and the processing of unusual and often highly toxic material.)

The American Institute of Chemical Engineers, meeting Dec. 13-16 in St. Louis, Mo., is scheduled to hear a paper on "Filtration of Radioactive Aerosols by Glass Fibers". The authors, are A. G. Blasewitz and B. F. Judson, of General Electric Co., Hanford Plutonium Works, Washington.

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BUSINESS NEWS...in the nuclear field...

PARTICIPATION OF BUSINESS IN NUCLEAR REACTOR PROJECT REQUESTED- An invitation has again been extended to private industry, by the USAEC, to submit proposals for the investment of risk capital in the recently announced project to build a full-scale nuclear reactor for generating electric power. The USAEC is proceeding as rapidly as possible with necessary decisions on architect-engineering considerations, site selection, and operating specifications. Since the initial announcement, the USAEC has discussed with several organizations proposals for building with private funds the steam turbine and electrical generating portions of the project and for operating the entire power plant. The USAEC encourages further evidence of industry's interest in private investment for the purpose of obtaining firsthand experience with the new technology involved in building and operating a large-scale reactor designed specifically for power-producing purposes. The location for the nuclear power plant site has not been chosen. Although the USAEC announced in October that sites near the geseous diffusion plants for the separation of uranium-235 would be considered, the agency has enlarged on this by explaining that the attractiveness of proposals involving private financing for the steam and electric generating portions of the plant and for operating the plant, would considerably influence the decision on plant site. Companies or organizations interested in participating may submit proposals prior to February 15th, 1954; detailed information may be obtained from the USAEC's Reactor Development Div., Washington 25, D. C.

NEW CONTRACT AWARDED- A contract has now been awarded Tracerlab, Inc., Boston manufacturer of nuclear instruments and allied devices, for the engineering and building of two extensive radiation monitoring systems, one for the gaseous diffusion plant at Oak Ridge, and one for the new gaseous diffusion plant at Portsmouth, Ohio. Contract award was made by Union Carbide and Carbon Corp., contract-operator of the USAEC's Oak Ridge plant, and holder of large contracts at the Portsmouth, Ohio, plant, which will be operated by Goodyear Tire and Rubber Co.'s subsidiary, Goodyear Atomic Corp.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS- Apparatus for the assay of radioactive carbon-14 by the Van Slyke-Steel procedure is now available from this manufacturer. It is pointed out that this method has several advantages over that of counting solid barium carbonate samples since for a given sample size measurements of lower specific activities are possible; further, that the overall sensitivity is greater, as counting losses due to window, air, or self-absorption are avoided.-- Nuclear Instrument & Chemical Corp., Chicago 10, Ill.

NOTES: A gamma ray fluoroscope, developed by Radioactive Products, Inc., Detroit 26, Mich., which uses cobalt-60 as a source, now makes available for industrial applications 4 watts of gamma radiation. The new instrument, which stands 7-feet high, has the radiocobalt in a steel-cased cylindrical lead shield 18-inches in diameter. It is recommended for non-destructive testing applications, as a low cost instrument with high penetration capabilities.

A miniature electrostatic source of high voltage for use with radiation survey instruments has now been developed by S.R. Gilford, S. Saito, and J. L. Herson, of the National Bureau of Standards, Washington. The device is an adaptation of the work of Holtz and Wommelsdorf (U.S. Pat. No. 1,071,196, Aug. 13, 1913) on influence-type generators of conventional size, but it uses modern printed circuit and miniaturization techniques. (Operation of this type of generator depends on the ability of one charged body to induce a charge in another close by.) The device is one result of a program sponsored by the Navy's Bureau of Ships for the investigation and application of techniques adaptable to low-cost mass production of radiation survey instruments.

Radiation Counter Laboratories, manufacturer of radioactivity measurement instruments, has now issued its new catalogue (No. 15) covering this firm's complete line of products: It invites requests for this catalogue, which should be addressed to 5122 West Grove Street, Skokie, Ill.

ADMINISTRATIVE PROBLEMS IN AN INDUSTRIAL ATOMIC PROGRAM: Excerpts of interest from remarks delivered by Eugene M. Zuckert, USAEC Commissioner, before National Assoc. of Manufacturers, Dec. 4, 1953, meeting in New York.

Today, any consideration of the use of atomic energy is conditioned by this basic fact: at least as long as this world exists in troubled half-peace, the same fissionable material which can be harnessed for power is a weapon of destruction. Thus, fissionable material is an essential resource for our national defense, and must be used in the national interest.

This dual potentiality of fissionable material makes it impossible to employ a laissez-faire philosophy in the development of its civilian use. Conversely, this does not mean the perpetuation of unlimited government control of the future of atomic energy.

In essence, then, the task of steering an effective course between these two extremes is the administrative problem that will face the USAEC and the segments of industry which will take part in the development of atomic energy.

Technologically, we really are not sure how we are going to achieve the most significant beneficial uses of atomic energy. Enough has been accomplished in the eleven years history of man's control of the chain reaction to convince us that there are dividends.

But opinion is divided among the experts on almost every crucial issue. As examples: Will atomic power be economical--and when? How is the best way to attain it? Would it come in on a sound basis if developed as a byproduct to production of fissionable material? How soon will there be a real need to supplement present sources of power? Scientists, industrialists, economists, and government experts disagree with each other.

Given the necessary leeway, I feel confident the USAEC can and will do a good job of administration, and industry a good job of speeding atomic progress.

Let me tick off a few instances of the USAEC's cooperation with and encouragement of private enterprise:

1.- At the outset, the USAEC decided to continue and expand the policy of using private contractors to do its work.

2.- It has encouraged the birth and growth of a brand new industry--that of supplying special instruments and machines to the users of atomic energy. Instruments developed in USAEC research have been made available for commercial production.

3.- A process for recovering economically small amounts of uranium in phosphate ores as a by-product of the normal production of certain fertilizers and acids has been turned over to private industry on an incentive basis.

4.- Contractors to the USAEC purified and developed the metallurgy of a new metal of great promise--zirconium--and its production has been turned over to private management.

5.- The USAEC took up the suggestion for self-financed studies of the economic feasibility of nuclear power, and today there are six teams with a total of 47 utility, chemical, construction, and one shipbuilding concern that are engaged in such studies.

Now, as to practical problems of administration: There are many.

There is the pricing of goods and services. By goods, I mean principally fissionable materials. An example of services would be the possible government reprocessing of reactor fuel and disposal of radioactive wastes from the reactors. What is to be done with the plutonium--even small amounts produced as a by-product of reactors? Can the plant sell it as fuel to new plants. Will the government buy it? At fuel prices or weapon grade prices? How much should the USAEC charge for services? Will engineering develop fast enough to enable industry to find a market for the by-product fission products, or will the government have to take these off its hands? All these questions must be worked out in the tedious job of preparing and carrying out the regulations regarding licensing of the use of fissionable material.

ATOMIC ENERGY IN CANADA: A special report of that nation's work in this field...

All phases of Canada's atomic work are described in the Atomic Energy Control Board of Canada's annual report for the year ended March 31st, 1953, released last week. Under the direction of the Board is the Government company, Atomic Energy of Canada, Ltd., which operates the Chalk River nuclear project, distributes radioisotopes produced there, and develops associated equipment. The Chalk River project includes, besides nuclear reactors, laboratories and associated works, the residential townsite of Deep River, which is some six miles from the plant. Chalk River's objectives are research, development, and utilization of atomic energy. The two atomic piles which were in operation at Chalk River during most of the year form the principal units of the projects extensive research facilities.

The low power reactor, ZEEP, has been in continuous operation, and provided information needed in the design of the new NRU reactor, now under construction. The NRX pile operated up to Dec. 12, 1952, when a burst of rods caused damage which has necessitated extensive repairs still in the process of being completed.

The research chemistry and operations groups, at Chalk River, have developed new methods of separating plutonium and certain valuable isotopes from the mixture of isotopes which, laboratory scale experiments indicate, will prove very efficient in plant operations. Methods of fabricating fuel rods enriched with plutonium have been worked out, and such rods employed in the reactor to provide excess neutrons for irradiation of materials used to produce isotopes.

More than 1,100 shipments of isotopes were made during the year. Six cobalt-60 beam therapy units were distributed to hospitals in London, Winnipeg, Vancouver, New York, Minneapolis, and Chicago. The demand for these units, and for isotopes with high specific activity for commercial applications, continues to be greater than the present facilities can supply. Revenue from the sale of isotopes and essential materials and rental of production facilities amounted to $451,581.

The plant at Chalk River for extracting plutonium from irradiated uranium and for the recovery of uranium from irradiated thorium continued in successful operation. A new plant for separating the depleted uranium from fission products has proved efficient.

The balance sheet (of Atomic Energy of Canada, Ltd.) shows land, building, and equipment for research purposes at cost of $40,773,026; research goods in progress costing $5,779,154 are carried on the books at a nominal value of $1. Additionally some $,7,347,348 has been spent on the new reactor, and it is estimated that $25 million will be required to complete the company's present construction program.

Advances occurred in prospecting and mining for uranium in Canada during the year, with work by private individuals and companies centered mainly in Northern Saskatchewan, says the report. There was lesser activity in the Northwest Territories, British Columbia, Manitoba, Ontario, and Quebec. By the end of 1952, it was estimated that a total of 645 properties or unstaked occurrences were known to contain uranium or thorium in amounts of 0.05% or more. At March 31st last, 130 exploration permits from the Board were in effect; diamond drilling was done at 22 properties; and underground exploration at 8. One mining permit was issued.

The radioactivity division of the Mines Branch, of the Canadian Department of Mines, continued and extended its work on the treatment of radioactive ores of various types, including complex and refractory minerals. Acid and alkaline leach methods, worked out in collaboration with Eldorado, have been installed at Port Radium, and Beaverlodge, respectively.

Grants totaling $144,675 were made to seven Canadian universities for basic nuclear research, and $55,325 to three universities for research on the treatment of uranium ores. The sum of $100,000 was used to assist work being done in the commercial products division in isotope research.

President of the Atomic Energy Control Board is Dr. C. J. Mackenzie. Other members are G. C. Bateman, mining consultant, Montreal; W.J. Bennett, president of Eldorado Mining and Refining, Ltd.; Dr. P. E. Gagnon, Laval University; Quebec; and Dr. E.W.R. Steacie, president, National Research Council, Ottawa.

ATOMIC PATENT DIGEST...latest U. S. grants...

Device for measuring the number of charged particles being emitted from a radioactive source in a given interval of time. Comprises (in part) collecting at least 99% of the liberated charged particles on two symmetrical conducting elements, in an evacuated region, with the confronting surfaces of these elements having substantially the same scattering and secondary electron producing characteristics with respect to charged particle radiation, and measuring the rate at which a charge is developed on at least one of these elements. U. S. Pat. No. 2,659,826 issued Nov. 17th, 1953; assigned to United States of America (USAEC). (Inventors: G. Failla, and H.H. Rossi.)

Orienting and scanning support for betatrons. Comprises (in part) a pair of trunnions having a horizontal axis of symmetry attached to the betatron, a yoke assembly having arms extending downwardly forming a support for the trunnions and providing for rotation of the betatron about the trunnion axis, with a motor for performing this rotation. Means are also provided for positioning the X-ray focal point on the vertical axis. U. S. Pat. No. 2,659,827 issued Nov. 17th, 1953; assigned to Allis-Chalmers Mfg. Co., Milwaukee, Wisc. (Inventors: D.T. Scag, and D. K. Getzlaff.)

Ion selector. An improvement in a mass spectrometer comprising means for producing a relatively weak magnetic field transverse to the direction of ion movement ahead of the collecting plate for rejecting stray electrons, the strength of this field being insufficient to appreciably deflect ions. U. S. Pat. No. 2,660,677 issued Nov. 24th, 1953; assigned to United States of America (USAEC). (Inventor: Alfred O.C. Nier.)

Plate design for pulse columns. Comprises a plate (for a two-phase extraction column) having several apertures in it, this plate comprising two layers of different material having apertures in alignment, one of these materials being fluorothene and the other of these materials being stainless steel, the diameter of the apertures being 0.076-inches. U. S. Pat. No. 2,662,001 issued Dec. 8th, 1953; assigned to United States of America (USAEC). (Inventors: W.A. Burns, and W.F. Johnson.)

Process of copolymerization. The method which comprises copolymerizing tetrafluoroethylene and trifluoromonochloroethylene in the presence of trichloroacetyl peroxide as a polymerization promoter at a temperature in the range of minus 20-deg. C., to 0-deg. C., to produce a copolymer composed of about 25% to about 85% by weight of tetrafluoroethylene and composed for the balance substantially entirely of trifluoromonochloroethylene. U. S. Pat. No. 2,662,072 issued Dec. 8th, 1953; assigned to United States of America (USAEC). (Inventor: W. T. Miller.)

Radioactive detector means in automatic steering systems. Comprising (in part) respective electro-mechanical operating devices respectively coupled to movable members, and operable to move these members in opposed directions. Two counter tubes, located respectively in the path of the ionizing rays which are emitted by a source of ionizing energy, are connected to the electromechanical operating devices through intermediate circuits, with means for controlling the delivery of the ionizing rays to the counter tubes. U. S. Pat. No. 2,662,208 issued Dec. 8th, 1953; assigned to Canadian Radium & Uranium Corp., New York, N.Y. (Inventor: Winston Wells.)

NOTES: Trade-mark registration No. 642,811 (U.S.) is to be granted Charles E. Frosst & Co., Montreal, Quebec, Canada, for the word ISOTAG, covering radioactive pharmaceutical and biological substances for diagnostic and/or therapeutic use.

Sincerely,

The Staff,
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